Future fertility after conservation surgery for cervical cancer

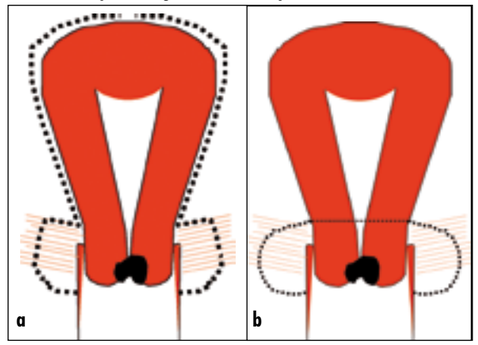
Advances in surgical techniques have resulted in some women presenting with invasive cervical cancer being able to receive curative treatment while preserving their fertility. The pregnancy outcomes are acceptable and women who have not completed their families should have this option discussed.

The young patient with early stage cervical cancer can expect to be cured of her condition by radical surgery. However, for many years this radical surgery required total removal of the uterus as a radical hysterectomy together with removal of the pelvic lymph nodes. The resultant loss of fertility causes considerable morbidity. The first pregnancies following a radical vaginal trachelectomy and laparoscopic pelvic lymphadenectomy were reported more than a decade ago (Dargent et al, 1994). As various gynaecological oncologists around the world have learned this surgical technique the value of the procedure has come to be accepted and data on the obstetric outcomes for these patients are being etablished.

Surgical technique

The accepted gold standard treatment for young patients with FIGO (Federation Internationale Gynecologic et Obstetric) stage 1aii and 1bi (confined to the cervix and less than 4 cm diameter) (Shepherd, 1989) tumours of the cervix has been radical hysterectomy. The principle is to radically remove the tumour with good surgical margins and also remove the relevant pelvic lymph nodes as the most common site of metastases (*Figure 1a*). The principle of the radical trachelectomy is exactly the same with the idea of being able to preserve the body and fundus of the uterus in order to potentially carry a pregnancy in future (*Figure 1b*).

Figure 1. a. Radical removal of a tumour usually involves the removal of the entire uterus. b. It is possible to radically remove the tumour while preserving the uterine body and fundus.



Mr Alan Farthing *is Consultant in Gynaecology Oncology, West London Gynaecological Cancer Centre, Queen Charlottes Hospital, London W12 0HS*

The procedure usually requires a combination of laparoscopic and vaginal surgery. Initially a laparoscopic pelvic lymphadenectomy is performed. In some centres this is done as a separate procedure allowing full histopathological examination before embarking on removal of the cervix after a week or more. Others perform intraoperative assessments so that the whole procedure can be completed under the same anaesthetic. The radical trachelectomy is usually performed vaginally. A cuff of vagina is taken as the epithelium is incised. Dissection anteriorly mobilizes the bladder and posteriorly the rectum. Parametrial margins can then be taken after identifying the ureters and uterine arteries, preserving them both, followed by amputation at the level of the uterine isthmus. A permanent cerclage with 1.0 nylon or similar material is then placed in the lower segment of the uterus and the vaginal epithelium sutured to the stump.

The procedure can also be performed abdominally (*Figure 2*) or entirely laparoscopically where the dissection is exactly the same as with a radical hysterectomy. This time the uterine arteries are divided and the ureteric canal dissected formally before dividing the vagina and amputating the cervix. The uterus takes its entire blood supply from the ovarian vessels until a collateral supply is established.

Delivery of any resulting fetus is by elective caesarean section.

Prognosis

Radical trachelectomies have been shown to have an acceptable cure rate for these patients. With over 260 patient results reported in the literature the recurrence rate is 3% (*Table 1*). This is equivalent to that expected by patients undergoing radical hysterectomy (Landoni et al, 1995). Doubts have been expressed about the suitability of the vaginal technique in patients with disease over 2 cm in diameter. The recurrence rate in these patients appears to be about 25% (Dargent et al, 2002) and these patients may be better suited to an abdominal or laparoscopic trachelectomy where greater parametrial margins are possible.

Figure 2. The cervix and parametrium are amputated at an abdominal trachelectomy.

Pregnancy outcomes

The pregnancy outcome data have been presented in the literature on a total of 334 patients who underwent a radical vaginal tracheletomy (Boss et al, 2005) (*Tables 2* and *3*). Of these 148 patients attempted to conceive. Of those that attempted to conceive, 70% succeeded. In the majority of those who failed to conceive there was a cervical factor listed with about 12% as a result of anovulation and 10–12% unknown.

The loss in the first trimester was approximately 16% and is relatively consistent between series. This is equivalent to the background risk in the population. Not surprisingly very few patients request a termination of pregnancy.

Table 1. Sequelae after radical vaginal trachelectomy

10–15% require completion hysterectomy
3% overall recurrent disease
Rises to 25% if tumour >2 cm diameter

From Dargent et al (2002)

Table 2. Pregnancy outcomes

21% first trimester loss
9% second trimester loss
21% delivery before 37 weeks
49% delivery at term

From Boss et al (2005)

The 9% risk of second trimester miscarriage is increased in comparison to the background risk of approximately 3%. Some series even have the risk of second trimester miscarriage as low as 4% (Plante et al, 2005) and suggest the reason for this is the authors' attempts to leave some small part of the cervix and amputate about 1 cm below the isthmus. A review of studies using cervical cerclage in other patients with proven cervical incompetence demonstrated a second trimester loss rate of 6% if the suture is placed abdominally and 12% if placed vaginally (Zaveri et al, 2002).

The data available for transabdominal cerclage are limited. Pregnancies have been reported and at least two healthy babies born (Ungar et al, 2005).

The data on the neonatal outcome of those born prematurely are incomplete.

Antenatal care

Care of the patients in these series has been varied. The first trimester losses have been treated conservatively in most cases although careful dilatation and curettage is possible. Some second trimester losses have been able to deliver vaginally and the inability of the cerclage to stop this process probably explains the reason for the loss. For those with the cerclage intact the options are either vaginal or abdominal hysterotomy. A failed pregnancy may compromise the integrity of the cerclage either directly or as a result of surgical intervention. No specific guidelines exist but the risk of heavy bleeding associated with a conservative approach should also be considered.

Prophylactic antibiotics and/or steroids have been used in an attempt to prolong pregnancy and improve neonatal outcome. The Saling procedure in which the vaginal epithelium is incised and sutured so that the os is closed over has been suggested. The second trimester loss rate

Table 3. Adjusted pregnancy outcome (excluding first trimester loss)

10% second trimester loss
26% delivery before 37 weeks
64% delivery at term

From Boss et al (2005)

was considerably improved in the one series after the Saling procedure was introduced (Mathevet et al, 2003).

The main reason for preterm delivery appears to be premature rupture of the membranes (PROM). A number of patients have been treated conservatively following PROM but most have required delivery within 3–5 days for chorioamnionitis. The delay in delivery contributed to at least one neonatal death suggesting that conservative management in these patients may not be appropriate.

Conclusions

Radical removal of the cervix and parametrium for young women with small invasive carcinomas of the cervix can be adequately achieved with a good cure rate. Although radical hysterectomy remains standard treatment this results in a total loss of fertility. Although the obstetric outcome in patients who have undergone radical vaginal trachelectomy is not as good as the background population it is comparable with those known to have cervical incompetence. **BJHM**

KEY POINTS

- Cervical cancer requiring radical surgery does not always result in infertility.
- Radical vaginal trachelectomy is suitable for patients with tumours less then 2 cm in diameter.
- In these women the cure is equivalent to radical hysterectomy.
- There is an increased incidence of second trimester loss and preterm delivery.
- Pregnancy outcomes are acceptable.

Conflict of interest: none

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